

Amendments to the Drawings:

Figure 9 has been amended to add reference numeral "5."

Attachment: Replacement Sheet

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REMARKS

By this amendment, Applicants have amended claim 1 to, inter alia, include therein part of the limitation previously recited in dependent claim 17, i.e., that one of the wiring boards is a polyimide wiring board. Applicants have canceled claims 2-6 and 17 without prejudice or disclaimer. Claims 7-16 have been amended to be consistent with claim 1, and claims 8-11 amended to depend from claim 7. Applicants have also added claims 18-20 to define further aspects of the present invention. The foregoing amendments to claim 1 are supported by original claim 17 and the description at, e.g., page 7, lines 14-16 and page 11, lines 9-16 of Applicants' specification. Claims 18 and 19 are supported by, e.g., Figures 6a and the description thereof in Applicants' specification. Claim 20 is supported by, e.g., page 12, lines 22-24 of Applicants' specification.

Applicants have amended Fig. 9 to include reference sign "5."

In view of the foregoing amendment to Fig. 9, reconsideration and withdrawal of the objection to the drawings on page 2 of the Office Action are requested.

Claim 12 stands rejected under 35 U.S.C. 101 and 112, first paragraph, the Examiner alleging there to be no asserted utility for the recitation in claim 12 that "said adhesive is formed by a two color printed process." These rejections are traversed, especially insofar as they apply to amended claim 12.

Initially, the Examiner's rejection relying on lack of utility is not understood. Clearly the adhesive, whether formed by a two color printed process or some other process, has utility, including to join the wiring boards to the heat sink and, at least with respect to the adhesive recited in claim 12, to conduct heat. Thus, a specific and substantial asserted utility and well established utility for the adhesive are provided.

In any event, Applicants have amended claim 12 to delete the phrase "is formed by a two color printed process." Accordingly, the rejections of claim 12 under 35 U.S.C. 101 and 112, first paragraph, are moot.

The Examiner has rejected claims 8 and 11 under 35 U.S.C. 101 as being non-statutory because they allegedly embrace or overlap two statutory classes of the invention and under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. These rejections are traversed.

Claims 8 and 11 are not directed to two statutory classes of invention. Claims 8 and 11 are directed to a single statutory class of invention, i.e., a machine or manufacture. It is not improper for such claims to rely on either process limitations (see, for example product-by-process claims) or functional limitations (Manual of Patent Examining Procedure (MPEP) 2114). The use of process and/or functional limitations does not take the claim out of the statutory class of machine or manufacture. See, MPEP §2113 and 2114.

Nevertheless, Applicants have amended claim 11 to delete the phrase "is circulated." It is submitted the phrase "is fixed on the interior of an automobile transmission assembly of an automobile" in claim 8 is not a "process of use" limitation as alleged by the Examiner, but specifies the location and the fixed nature of the connection between the electronic circuit apparatus and the automatic transmission assembly of the claimed structure.

Accordingly, withdrawal of the rejections of claims 8-11 under 35 U.S.C. 101 and 112, second paragraph, are requested.

In view of the cancellation of claim 3 and the deletion of the phrase "two color printed process" in claim 12, it is submitted the rejection of these claims under 35 U.S.C. 112, second paragraph, is moot.

Claims 1, 6, 7, 13, 14 and 16 stand rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 4,763,188 to Johnson in view of U.S. Patent application publication number US 2003/0137032 A1 to Abbott. Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson and Abbott and further in view of U.S. Patent application publication number 2001/0003373 A1 to Akram. Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson and Abbott and further in view of U.S. Patent application publication number 2001/0022404 A1 to Yamamoto. In view of the foregoing amendments to the claims, including the cancellation of claims 2-6 and the amendment to claim 1 including therein one of the limitations previously recited in claim 17, it is submitted these rejections are moot.

Applicants submit the only prior art rejection in the outstanding Office Action relevant to the amended claims is the rejection of claim 17 under 35 U.S.C. 103(a) as being unpatentable over Johnson and Abbott and further in view of U.S. patent application publication number 2001/0005048 A1 to Krause et al. Applicants traverse this rejection and request reconsideration thereof, at least insofar it applies to the claims presently in the application.

The invention has as an objective the realization of high-density mounting, high heat-dissipating characteristics, and high reliability all at the same time in an electronic circuit apparatus that is required to provide heat resistance and hermetic sealing under a harsh environment. In an electronic circuit apparatus, it is effective to adopt a multilayered wiring board as the wiring board from the viewpoint of high-density mounting. However, a multilayered wiring board does not readily allow sufficient dissipation of heat to the heat sink when it is subjected to a high-temperature environment. In accordance with the invention, a multilayered wiring board and a polyimide wiring board with its superior heat-dissipating property are provided with a heat sink disposed therebetween, wherein at least one heat-

generating element is mounted on the polyimide wiring board with its superior heat-dissipating property. In this way, the invention enables the simultaneous realization of high-density mounting and heat dissipating property even under a harsh environment where high levels of heat resistance and hermetic sealing are required.

The Johnson patent disclose a resin-sealed semiconductor apparatus comprising wiring boards 13 and 14 on which a plurality of elements are mounted, wherein the wiring boards are disposed such that they sandwich a lead frame 29 (which the Examiner considers a heat sink). However, the reference does not disclose that a multilayered wiring board and a polyimide wiring board are used in combination with at least one heat-generating element mounted on the polyimide wiring board, as in the present invention. The Johnson patent does not suggest, either, the effect of the present invention, i.e., that high-density mounting and heat dissipating property can be both realized at the same time even under a harsh environment where high levels of heat resistance and hermetic sealing are required.

The Abbott publication discloses a lead frame for use with integrated circuit chips comprising a base metal, using copper or a copper alloy, having a modified surface adapted to provide bondability and solderability and adhesion to polymeric compounds. This document discloses that a molding compound encapsulates a mounted chip, bonding wires and first ends of leads segments, and that the molding compound is selected from a group consisting of epoxy-based thermoset molding compounds suitable for adhesion to the lead frame. However, it is submitted the Abbott publication does not remedy any of the basic deficiencies noted above with respect to Johnson.

While Krause describes the combination of an epoxy substrate and a polyimide substrate, the reference merely discloses the configuration in which a circuit carrier substrate (epoxy substrate) on which an IC chip is mounted is mounted

on a flexible substrate (polyimide substrate); it does not disclose the technical concept of the present invention, i.e., that a polyimide wiring board and a multilayered wiring board are used for different purposes in consideration of heat dissipation.

Accordingly, the proposed combination of Johnson, Abbott and Krause et al. would not have suggested the presently claimed invention.

In response to the requirement for information under 37 CFR 1.105 on pages 14 and 15 of the Office Action, the undersigned has been advised that Applicants are, as of now, are not aware of any prior art disclosing "[a]n (any) electronic circuit apparatus [that] is fixed on an interior of an automatic transmission assembly of an automobile and a passage for circulating a transmission fluid [that] is formed in any part of the electronic apparatus to cool the apparatus."

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all the claims now in the application are requested.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus Deposit Account No. 01-2135 (Case: 1021.43671X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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Attachments